It has been estimated that approximately 90 million people in North America suffer from sleep disorders including insomnia, snoring and sleep apnea.

Snoring is extremely common in our society, as it has been estimated that 60 percent of men snore and 40 percent of women over age 50 snore. Snoring occurs when there is a partial obstruction of the airway that causes the palatal tissues to vibrate.

Snoring is a serious social problem for the bed partner and adversely affects many relationships. I treat many patients where snoring is a significant negative factor in their lives. Some studies report that the bed partners’ sleep is seriously affected by as much as one hour per night, which can have a negative affect on their health as well due to their lack of adequate sleep (this is similar to the negative health issues associated with second hand smoke).

USA Today reported that 27 percent of couples over age 40 sleep in separate bedrooms. I think there is a direct correlation between this and the incidence of snoring. As the incidence of obesity continues to increase in our society, these numbers are going to continue to increase.

Sleep apnea is a medical disorder that can only be diagnosed by a sleep specialist in a sleep clinic. The patient must have an overnight sleep study called a polysomnogram that is evaluated by the sleep specialist.

Many sleep specialists prefer to prescribe the CPAP (continuous positive air pressure) device to treat obstructive sleep apnea and do not appreciate the effective role that oral appliances can provide for patients who have mild or moderate OSA (obstructive sleep apnea) or patients who cannot tolerate the CPAP device. A significant breakthrough occurred for the dental profession in 2006. In the January issue of the medical journal Sleep, the American Academy of Sleep Medicine (medical sleep specialists) issued guidelines stating that for patients with mild to moderate obstructive sleep apnea, the oral appliance was the No. 1 treatment option. The guidelines also stated that oral appliances were a viable option for treatment for patients who do not respond to weight loss or have tried the CPAP device and were unable to tolerate it.

The diagnosis for OSA is made using an apnea-hypopnea index (AHI). The diagnosis is made during an overnight sleep study in a hospital or private sleep clinic. This sleep study is known as a PSG (polysomnogram). The number of apneic and hypopnic events are recorded as follows:

- **Sleep apnea:** tongue completely blocks airway
  - **apnea:** a cessation of breath for 10 seconds or more
  - **hypopnea:** the blood oxygen level decreases 4 percent or more cessation of breath for less than 10 seconds
- **mild sleep apnea (osa):** 5-15 events per hour
- **moderate sleep apnea (osa):** 16-30 events per hour
- **severe sleep apnea (osa):** more than 30 events per hour

There are three treatment options for obstructive sleep apnea:
- oral appliances
- CPAP device (continuous positive air pressure)
- surgical removal of structures causing the obstruction

The diagnosis of obstructive sleep apnea can only be made by a medical professional, and it is usually a sleep specialist. Therefore, dentists must send their patients to a hospital or private sleep clinic for a polysomnogram (16-channel overnight sleep study). Only when the written report is received from the sleep center can the dentist proceed with the fabrication of oral appliances.

The dentist should review the sleep study with the patient once the AHI...
Snoring

Fig. 2: This is what happens to those who snore: the tongue partially blocks the airway and causes the palatal tissues to vibrate. (Photo/Provided by Dr. Rondeau)

Nasal obstruction

Before treatment, clinicians must determine whether or not there are any nasal obstructions that would interfere with the patient's ability to breathe through his/her nose. If the patient is a chronic mouth breather, the patient should be referred to an ENT specialist to check for a deviated septum, enlarged turbinates, polyps or other nasal obstructions.

A determination must be made whether or not the nasal mucosa is swollen due to allergies, which might cause a nasal obstruction.

In our office, we have a diagnostic device known as a rhinometer that is an initial screening device to determine if there is a nasal obstruction in either nostril. The rhinometer is an accurate, non-invasive device that evaluates the potential obstruction by sending sound waves up the nose and any obstructions are recorded on a computer.

Hypopharyngeal obstructions

Our office uses a pharyngometer to diagnose the size of the airway during the daytime as well as nighttime. It is used at the initial appointment to check the patient's normal airway (daytime) and the collapsed airway (nighttime). To assess the size of the collapsed airway at night, the patient is instructed to exhale all the air from his/her lungs and a measurement of the airway is taken.

The normal size of a collapsed airway is 2.0 cm. Patients with OSA usually have a much smaller collapsed airway. Bite registrations in different positions are taken to see how much the airway may be increased.

By moving the mandible forward at different vertical heights, we determine if the oral appliance will open the airway in that position significantly. In most cases, when a bite registration reveals that the airway opens significantly when the oral appliance is fabricated in that position, the treatment is usually successful.

Oral appliances

Oral appliances are extremely effective in eliminating snoring and OSA, particularly in patients with mild to moderate OSA.

They function by moving the lower jaw and, consequently the tongue, forward to open up the airway. They hold the lower jaw forward when the patient sleeps on his/her back, which keeps the airway open all night.

The literature is replete with articles regarding the effectiveness of different oral appliances. Patients find that oral appliances are extremely comfortable to wear.

Three different oral appliances that are used to prevent snoring and OSA include Inspire, EMA and the Suad appliance. The appliances all work essentially the same way by gradually moving the lower jaw forward in small increments and increasing the vertical dimension, which ultimately increases the size of the pharyngeal airway.

It is imperative that dentists learn to treat patients with mild to moderate OSA and those who cannot tolerate the CPAP device. There are thousands of patients who have been diagnosed with OSA and cannot wear the CPAP. The health of these patients is continuing to deteriorate and their life expectancy shortened while the dental profession holds the key to their treatment.

I have treated many patients with severe OSA who could not wear the CPAP device and successfully reduced their apneic events below five times per hour, which is normal. This treatment certainly improves their health and prolongs their life by reducing their blood pressure and their susceptibility to heart attack, stroke and type 2 diabetes.

Conclusion

The prevalence of OSA is exceedingly high in first-world countries mainly due to the increase in the rate of obesity. An estimated 25 percent of males and 9 percent of females will develop obstructive sleep apnea in their lifetime.

It is important for the dental profession to educate their staff and themselves so they can learn to diagnose and treat the large number of appropriate patients with oral appliances.

The failure rate with CPAP is close to 70 percent, which means a large number of patients will seek alternative treatment. The medical and dental profession has not done an adequate job in educating the CPAP failure patients about the existence of oral appliances as an alternative.

Dentists can significantly improve the health of these patients and the profession must get involved now when the need is so critical.

A complete list of references is available from the publisher.

About the author

Dr. Brock Rondeau is one of North America’s most sought-after clinicians and lectures more than 100 days per year. He is a master senior certified instructor for the International Academy of Craniofacial Pain. Rondeau is a diplomate of the International Board of Orthodontics and its past president.

More than 19,000 dentists have attended his courses and study clubs in the United States, Canada, China, Australia, England and Poland.

He has a busy practice limited to the treatment of patients with orthodontic, snoring and sleep apnea and TMJ problems. Rondeau is a diplomate of the International Board of Orthodontics and a diplomate of the American Academy of Craniofacial Pain.

For more information about his seminars and to contact him, please visit www.rondeauseminars.com.